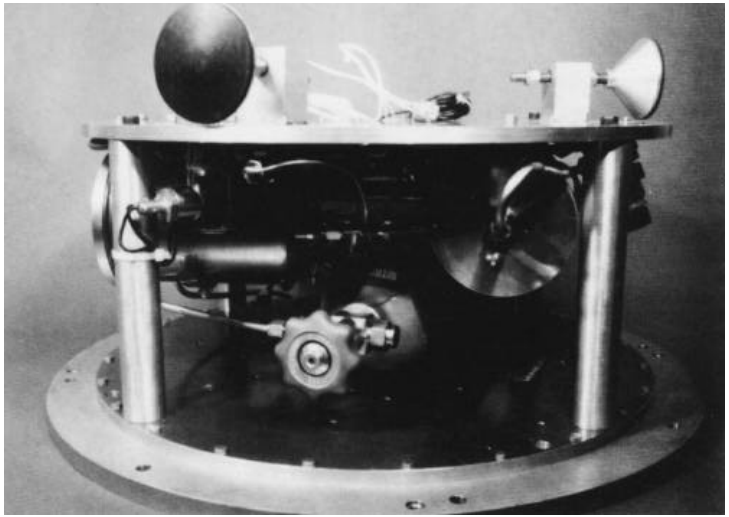
G-446

42

Customer: Alltech Associates, Inc.;
Brent R. Erwin
Payload Mgr: Brent R. Erwin
NASA Tech Mgr: Fred M. Witten
Mission: STS-61-C, January 12, 1986

Fields as varied as medicine, law enforcement, and petroleum processing could have benefited from the results from G-446. Designed by Alltech Associates, Inc. of Waukegan, Illinois, this experiment manufactured High Performance Liquid Chromatography Analytical Columns in microgravity. Used for chemical analysis, the columns allowed the separation of a chemical mixture into its components, so the chemicals could be quantified. When manufactured on Earth, the columns were not as efficient as theoretically possible, because the minute particles with which they were packed did not settle uniformly. The experiment's designers expected that by reducing gravity, a more efficient column would be produced.



Alltech Associates expected G-446 to prove that a microgravity environment could benefit chemical analysis work.

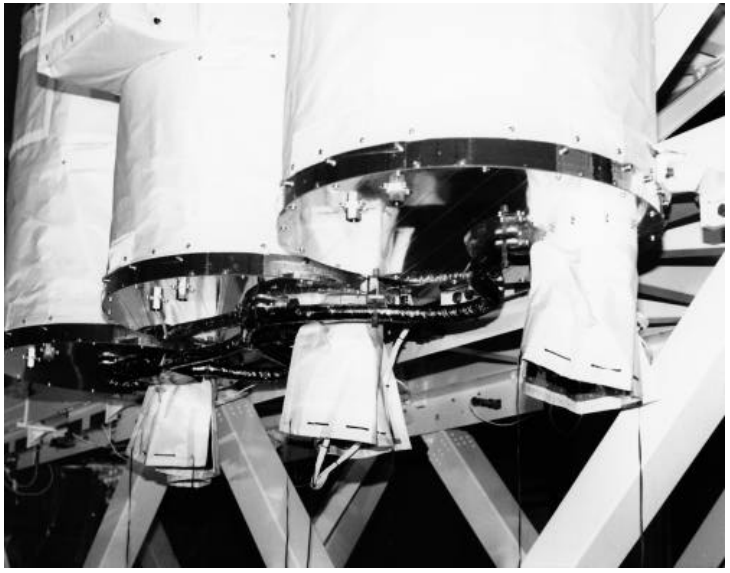
G-462

43

Customer: NASA Office of Space Science and Applications; Burton I. Edelson
Payload Mgr: Theodore C. Goldsmith
NASA Tech Mgr: Norman E. Peterson, Jr.
Mission: STS-61-C, January 12, 1986

An ambitious viewing agenda was planned for this three-container payload. The two ultraviolet spectrometers in this Ultraviolet Cosmic Background Experiment (UVX) were to look into distant space to observe the high energy spectrum thought to be associated with the origin of the universe. Other observational targets included galaxies, dust areas, the Comet Halley, and selected stars.

The experiment's design was as unique as its function: it was the only set of GAS experiments to fly as a group of three electrically interconnected containers. It consisted of the Feldman Spectrophotometer from Johns Hopkins University (in container G-463); the Bowyer UV Spectrometer from the University of California, Berkeley (in container G-464); and the Goddard Space Flight Center support avionics system (payload G-462). Finding an opportunity to fly these three GAS containers side-by-side was so difficult that the UVX experiment will retain the distinction of being the only experiment to use three or more interconnected GAS containers.



The three experiment cans containing G-462, G-463 and G-464 were electrically connected together as shown in this photo of the underside of the joined payloads.

G-449

44

Customer: St. Mary's Hospital, Milwaukee
Payload Mgr: Myron C. Muckerheide
NASA Tech Mgr: Alan Lindenmoyer
Mission: STS-61-C, January 12, 1986

Project JULIE (Joint Utilization of Laser Integrated Experiments) marked two firsts for the GAS program: it was the first payload flown by a private hospital and later became the first to be displayed at the National Air and Space Museum. Project JULIE was built by Saint Mary's Hospital of Milwaukee, Wisconsin, which had solicited the payload's 20 medical and laser experiments from researchers throughout the nation.

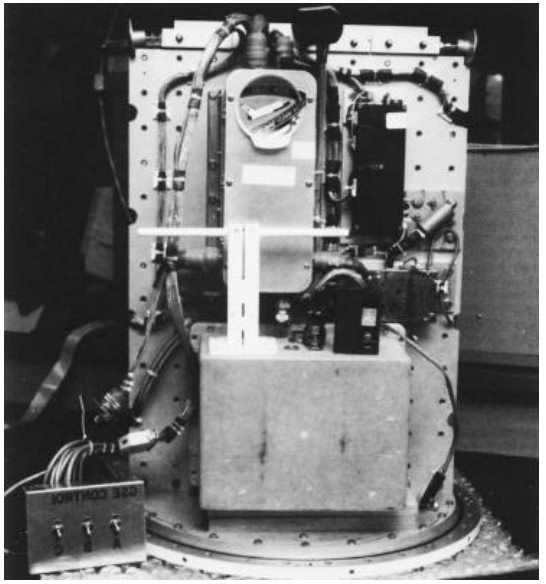
Sister Julie Hanser, President of St. Mary's Hospital, and Mike Muckerheide, payload manager, reported on G-449's results at a postflight press conference.

G-007

45

Customer: Alabama Space and Rocket Center; Edward O. Buckbee
Payload Mgr: Konrad K. Dannenberg
NASA Tech Mgr: Jack O. Gottleib
Mission: STS-61-C, January 12, 1986

New capabilities resulted from an initial setback: when G-007 flew on STS-41-G, it was not turned on. Postflight investigation determined the experiments were not at fault, and they were awarded this reflight. Taking advantage of the experience gained from their first flight, the experimenters refined their original payload for this mission. They installed a Solid Rocket Booster battery more powerful than the type previously used. This made it possible to add a new oven to the alloy solidification experiment and heaters to the radish seed experiment. The timeline of the crystal growth chamber changed from 24 hours to full mission duration. The radio transmissions experiment increased its output from 0.5 to 5.0 watts, and transmissions occurred at the start of each minute instead of every four minutes. With these improvements, the experiments and radio transmissions on G-007's second flight yielded excellent data.



The "box" to the left of the t-shaped antenna was a Digitalker, which turned G-007's data into voice signals that were broadcast to radio hams around the world.

G-481

46

Customer: Vertical Horizons;
Howard Wishnow
Payload Mgr: Howard Wishnow
NASA Tech Mgr: Richard Scott
Mission: STS-61-C, January 12, 1986

Aside from survival, people living in space will have many needs, among them, the aesthetic. Artist Ellery Kurtz and environmental psychologist Howard Wishnow founded Vertical Horizons, a company dedicated to the enhancement of life in space. Their GAS payload transported samples of painted linen canvases and other artistic materials into space. They evaluated the materials postflight to learn how the space environment had affected them. The experiment formed a foundation for the future study of methods for transporting visual art objects in space.

(L to R) Ellery Kurtz and Howard Wishnow discussed the pigments used in the artwork experiments in G-481.

G-463

Customer: NASA Office of Space Science and Applications; Burton I. Edelson
Payload Mgr: Theodore C. Goldsmith
NASA Tech Mgr: Norman E. Peterson, Jr.
Mission: STS-61-C, January 12, 1986

An ambitious viewing agenda was planned for this three-container payload. The two ultraviolet spectrometers in this Ultraviolet Cosmic Background Experiment (UVX) were to look into distant space to observe the high energy spectrum thought to be associated with the origin of the universe. Other observational targets included galaxies, dust areas, the Comet Halley, and selected stars.

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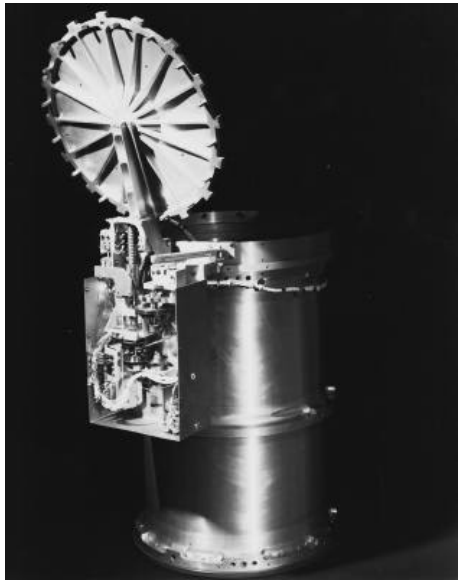


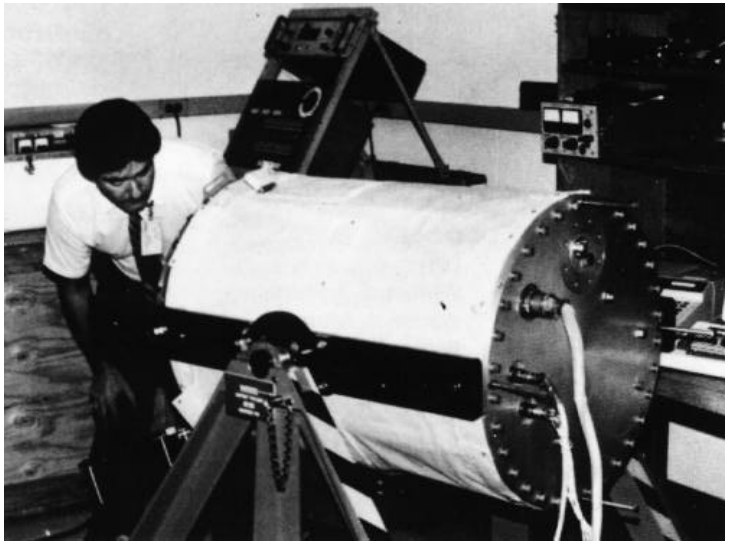
This photo exhibits the Motorized Door Assembly without insulating blanketing used on G-463.

G-494

48

Customer: National Research Council of Canada; R.D. Hendry
Payload Mgr: C. R. Barrett
NASA Tech Mgr: Robert Demorest
Mission: STS-61-C, January 12, 1986

Photometric Thermospheric Oxygen Nightglow Study (PHOTONS) was designed to study oxygen chemistry in the Earth's thermosphere, as well as, the "shuttle glow" caused by the chemical reaction between shuttle emissions and the space environment. In the thermosphere, the region between 80 and 500 kilometers (50 and 300 miles) above the Earth, the atmosphere changes from a molecular to an atomic nature. Currently, little is known about the thermosphere. With more information, better models can be made to predict both natural and human-related changes in this region. The second aspect of PHOTONS' study provided information on how light contamination or "shuttle glow" affects measurements made by telescopes, interferometers, and other instruments carried on the shuttle. To carry out its two-fold research, PHOTONS used seven photometers built at the Herzberg Institute of Astrophysics of the National Research Council of Canada.



Studying shuttle glow was one of G-494's goals. Frank Harris, National Research Council of Canada, checked the payload.

G-062

49

Customer: General Electric Company
Space Division; Bob Birman
Payload Mgr: Cathy Wolfgang
NASA Tech Mgr: Charles R. Laverty
Mission: STS-61-C, January 12, 1986

G-062 not only provided Penn State engineering students with first hand experience in spacecraft testing, it provided data on critical problems facing aerospace industries. Fuel slosh, which causes a disturbance in the spin axis of satellites, was one of the problems investigated on the payload. In another experiment, liquid droplets were formed and shattered, yielding the liquid's surface tension. Comparing this data with that collected on Earth, students could determine the effect of gravity on surface tension and help quantify surface tension formulae. A third experiment was designed to determine how convection contributes to heat transfer by comparing two identical experiments, one performed in space, the other on Earth. G-062 was donated to Penn State University by General Electric's Space Division.

Penn State students Troy Taylor (L) and Dave Moul assembled the G-062 payload.

G-464

Customer: NASA Office of Space Science and Applications; Burton I. Edelson
Payload Mgr: Theodore C. Goldsmith
NASA Tech Mgr: Norman E. Peterson, Jr.
Mission: STS-61-C, January 12, 1986

An ambitious viewing agenda was planned for this three-container payload. The two ultraviolet spectrometers in this Ultraviolet Cosmic Background Experiment (UVX) were to look into distant space to observe the high energy spectrum thought to be associated with the origin of the universe. Other observational targets included galaxies, dust areas, the Comet Halley, and selected stars.

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President Reagan examined GAS hardware with James Beggs (L), NASA Administrator, and Dr. Vincent Salomonson (R), Chief, Goddard's Laboratory for Terrestrial Physics, during a Goddard visit.

G-332

51

Customer: Booker T. Washington High School; F.D. Wesley
Payload Mgr: F. D. Wesley
NASA Tech Mgr: Philip T. Smith
Mission: STS-61-C, January 12, 1986

Students from Houston's Booker T. Washington High School and the High School for Engineering Professions shared payload G-332 to conduct research in the areas of the life sciences and fluid physics. Washington High students flew the brine shrimp Artemia to determine the behavioral and physiological effects of microgravity on cysts hatched in space. Students from the engineering high school examined the thermal conductivity and bubble velocity of air and water, substances which separate when combined on Earth due to differences in their densities.

Booker T. Washington High School students received a proclamation for their GAS payload from Houston Mayor Kathy Whitmire and City Councilman Dale Gorczynski (behind mayor).

G-310

52

Customer:	Department of Defense Space Test Program; Colonel William F. Fratzke
Payload Mgr:	Capt. Christopher J. Worsowicz
NASA Tech Mgr:	David W. Peters
Mission:	STS-61-C, January 12, 1986

How would vibrating metal react in microgravity? Would the lack of atmospheric pressure in space make vibrations last longer or be stronger than on Earth? These types of questions—relevant to designers and builders of solar arrays and other spacecraft structures—were studied in the U.S. Air Force Academy's Flexible Beam Experiment (FLEXBEAM). To carry out this research, an aluminum beam, fixed at one end and free at the other, was struck with a hammer driven by a rotary solenoid. Five strain gauges measured vibrations. A damping solenoid at the beam's free end then brought the vibrations under control. The damping characteristics were recorded for comparison with those from an Earth-bound control experiment.

FLEXBEAM measured microgravity's impact on vibrating metal.

G-470

53

Customer: Goddard Space Flight Center; Noel W. Hinners
Payload Mgr: Dora K. Hayes
NASA Tech Mgr: Mark D. Goans
Mission: STS-61-C, January 12, 1986

The moth in space project was developed by the U.S. Department of Agriculture (USDA) and Goddard Space Flight Center to learn if weightlessness could be a key to halting the devastation caused by gypsy moths. These pests have been responsible for defoliating millions of acres of trees in the United States. USDA scientists hoped to increase their ability to raise sterile male moths, which would then be mated with females to produce sterile offspring. If weightlessness was found to reduce the insect's hibernation period, sterile males could be bred more quickly, and the defoliation brought under control.

The thermograph in the center of the gypsy moth experiment recorded temperature over long periods of time.